Customer No.: 31561
Application No.: 10/707,354
Docket No.: 10465-US-PA

To the Claims:

1. (currently amended) A circuit for enhancing a slew rate of an operational amplifier by providing an assistant current to a **main** output stage outputting a main current, comprising:

a monitoring stage for receiving signals **from** the main output **stage** and outputting a ~~decayed~~ push signal and a ~~decayed~~ **pull** signal, wherein the main output stage comprises a first field effect transistor with **a first** type and a second field effect transistor with a second type, the gates of the first **and** second field effect transistors are connected to an output of a differential **amplifier** and the main current comprises a quiescent DC biased current, and the push signal and the pull signal are level shifted from the output of the differential amplifier; and

an assistant output stage comprising a third field effect transistor with the first type and a fourth field effect transistor with the second type, wherein a first input and a second input of the monitoring stage are connected to the gate of the first field effect transistor with the first type and the gate of the **second** field effect transistor with the second type, respectively, so as to receive signals from the main output stage, and then a first output and a second output of the monitoring stage are connected to the gate of the third field effect transistor with the **first** type and the gate of the fourth field effect transistor with the second type, respectively, so as to output the ~~decayed~~

To the Claims:

1. (currently amended) A circuit for enhancing a slew rate of an operational amplifier by providing an assistant current to a main output stage outputting a main current, comprising:

a monitoring stage for receiving signals from the main output stage and outputting a ~~decayed~~ push signal and a ~~decayed~~ pull signal, wherein the main output stage comprises a first field effect transistor with a first type and a second field effect transistor with a second type, the gates of the first and second field effect transistors are connected to an output of a differential amplifier and the main current further comprises a quiescent DC biased current~~;~~, and the push signal and the pull signal are level shifted from the output of the differential amplifier; and

an assistant output stage comprising a third field effect transistor with the first type and a fourth field effect transistor with the second type, wherein a first input and a second input of the monitoring stage are connected to the gate of the first field effect transistor with the first type and the gate of the second field effect transistor with the second type, respectively, so as to receive signals from the main output stage, and then a first output and a second output of the monitoring stage are connected to the gate of the third field effect transistor with the first type and the gate of the fourth field effect transistor with the second type, respectively, so as to output the ~~decayed~~

push signal and the ~~decayed~~ pull signal to the assistant output stage.

2. (previously amended) The circuit of claim 1, wherein the monitoring stage comprises a fifth field effect transistor with the first type and a sixth field effect transistor with the second type.

3. (original) The circuit of claim 1, wherein the assistant current is turned on automatically after the main current is turned on.

4. (original) The circuit of claim 1, wherein the assistant current is turned off automatically before the main current is turned off.

5. (currently amended) A method for enhancing a slew rate of an operational amplifier, comprising:

generating a first pull current and a first push current from a main output stage, wherein the main output stage comprises a first field effect transistor with ~~the~~ a first type and a second field effect transistor with ~~the~~ a second type, the gates of the first and the second field effect transistors are connected to a first output and a second output of a differential amplifier;

the first output voltage of the differential amplifier turning on the first field effect transistor with the first type so as to generate the first push current, and the second output voltage of the differential amplifier turning on the second field effect transistor with the second type so as to generate the first pull current, wherein the first

push current and the first pull current further comprises a quiescent DC biased current;

generating a ~~decayed~~ second push current when the first output voltage of the differential amplifier passes through a fifth field effect transistor with the first type to the gate of a third field effect transistor with the first type;

generating a ~~decayed~~ second pull current when the second output voltage of the differential amplifier passes through the gate of a sixth field effect transistor with the second type to the gate of a fourth field effect transistor with the second type, whereby the ~~decayed~~ second push current or the ~~decayed~~ second pull current is generated as an assistant current when either the third field effect transistor with the first type is turned on or the fourth field effect transistor with the second type is turned on.

6. (cancelled)

7. (currently amended) The method of claim 5, wherein the ~~decayed~~ second push current ~~and~~ or the ~~decayed~~ second pull current ~~are~~ is turned on automatically after the main current is turned on.

8. (currently amended) The method of claim 5, wherein the ~~decayed~~ second push current ~~and~~ or the ~~decayed~~ second pull current ~~are~~ is turned off automatically before the main current is turned off.

9. (currently amended) A circuit for enhancing a slew rate of an operational amplifier by providing an assistant current to a main output stage outputting a main current, comprising:

a monitoring stage, comprising a first DC voltage source for generating a ~~decayed~~ push signal and a second DC voltage source for generating a ~~decayed a~~ pull signal, wherein a first end of the first DC voltage source is connected to the gate of a first field effect transistor with ~~the~~ a first type, ~~another~~ a first end of the second DC voltage source is connected to the gate of a second field effect transistor with ~~the~~ a second type, the first and second field effect transistors constitute the main output stage, the gates of the first and second field effect transistors are connected to an output of a differential amplifier and the main current further comprises a quiescent DC biased current; and

an assistant output stage, comprising a third field effect transistor with the first type and a fourth field effect transistor with the second type, wherein a second end of the first DC voltage source is connected to the gate of the third field effect transistor, and ~~another~~ a second end of the second DC voltage source is connected to the gate of the fourth field effect transistor, whereby the assistant current is generated when either the third field effect transistor is turned on or the fourth field effect transistor is turned on.

10.(canceled)

11.(original) The circuit of claim 9, wherein the main current further comprises a quiescent DC biased current;

12.(original) The circuit of claim 9, wherein the assistant current is generated when either the third field effect transistor is turned on or the fourth field effect transistor is turned on.

13. (original) The circuit of claim 1, wherein the first type is P type and the second type is N type.

14. (original) The circuit of claim 1, wherein the first type is N type and the second type is P type.

15. (original) The method of claim 5, wherein the first type is P type and the second type is N type.

16. (original) The method of claim 5, wherein the first type is N type and the second type is P type.

17. (original) The circuit of claim 9, wherein the first type is P type and the second type is N type.

18. (original) The circuit of claim 9, wherein the first type is N type and the second type is P type.

19. (new) The circuit of claim 1, wherein the monitoring stage comprises a first

voltage source to generate the push signal by level shifting the voltage of the first input of the monitoring stage, and a second voltage source to generate the pull signal by level shifting the voltage of the second input of the monitoring stage.

20. (new) The circuit of claim 1, wherein the voltage of the push signal is higher than the voltage of the first input of the monitoring stage, and the voltage of the pull signal is lower than the voltage of the second input of the monitoring stage.

21. (new) The circuit of claim 1, wherein the voltage of the push signal is lower than the voltage of the first input of the monitoring stage, and the voltage of the pull signal is higher than the voltage of the second input of the monitoring stage.

To the Claims:

Please amend Figures 2 & 3 according to the replacement drawings.